

Flat Series

SGMPH Servomotors - With Incremental / Absolute Encoder

Rated Output: 100W, 200W, 400W,
750W, 1500W



For Additional Information	Page(s)
SGMPH Ratings & Specifications	30
SGMPH Speed/Torque Curves	31
SGMPH Dimensions	32 - 40
SGMPH Selection/Ordering Information	41 - 45
SGDH Ratings & Specifications	99 - 100
SGDH Dimensions	101 - 112

Design Features

1. Compact

- The length is about 1/2 of conventional motors
- Enhanced withstand load since motor output shaft bearing size is upgraded
- Up to 5000rpm maximum speed

2. Enhanced Environmental Resistance

- Water resistance (not including the shaft), IP67 standard
- Optional shaft seals available
- Reinforced lead-out cable access

3. Encoders (reduced wiring serial encoder)

- 13-bit (2,048ppr x 4) incremental encoder (standard)
- 16-bit (16,384ppr x 4) absolute encoder (option)

4. Application Emphasis

- Chip mounters
- PCB drilling machines
- Robots
- Conveyor
- Packaging

5. Certified International Standards

- UL, cUL recognized, (File #: E165827), CE compliance

Servomotor Ratings and Specifications

Time Rating:	Continuous	Enclosure:	Totally-enclosed, self-cooled	Excitation:	Permanent magnet
Insulation:	Class B	Ambient Temperature:	0 to 40°C	Drive Method:	Direct drive
Vibration:	15µm or less	Ambient Humidity:	20 to 80% (non-condensing)	Mounting:	Flange-mounted
Withstand Voltage:	1500V _{ac}			Applicable Encoder:	
Insulation Resistance:	500V _{DC}	Rated Rotation Speed:	3000rpm		13-bit Incremental and
	10MΩ or more	Maximum Rotation Speed:	5000rpm		16-bit Absolute encoder

SGMPH
Servomotors

Applied Voltage	MOTORS: SGMPH-	Rated Output	Rated Torque		Instantaneous Peak Torque		Continuous Rated Current*	Maximum Peak Current*	Rated Angular Acceleration	Rated Power Rate
		W (hp)	oz · in	N · m	oz · in	N · m	A _{rms}	A _{rms}	rad/s ²	kW/s
200V _{ac}	01A	100 (0.13)	45.1	0.318	135	0.96	0.89	2.8	64800	20.4
	02A	200 (0.27)	90.1	0.637	270	1.91	2.0	6.0	33000	21.0
	04A	400 (0.54)	180	1.27	542	3.82	2.6	8.0	38500	49.0
	08A	750 (1.01)	338	2.39	1010	7.1	4.1	13.9	11400	27.0
	15A	1500 (2.01)	676	4.77	2027	14.3	7.5	23.0	11900	56.7
100V _{ac}	01B	100 (0.13)	45.1	0.318	135	0.96	2.2	7.1	64800	20.4
	02B	200 (0.27)	90.1	0.637	270	1.91	2.7	8.4	33000	21.0
	04A**	400 (0.54)	180	1.27	542	3.82	2.6	8.0	38500	49.0

* Values are calculated when the servomotor is combined with an SGDh servo amplifier.

** When combined with an SGDh-04FE

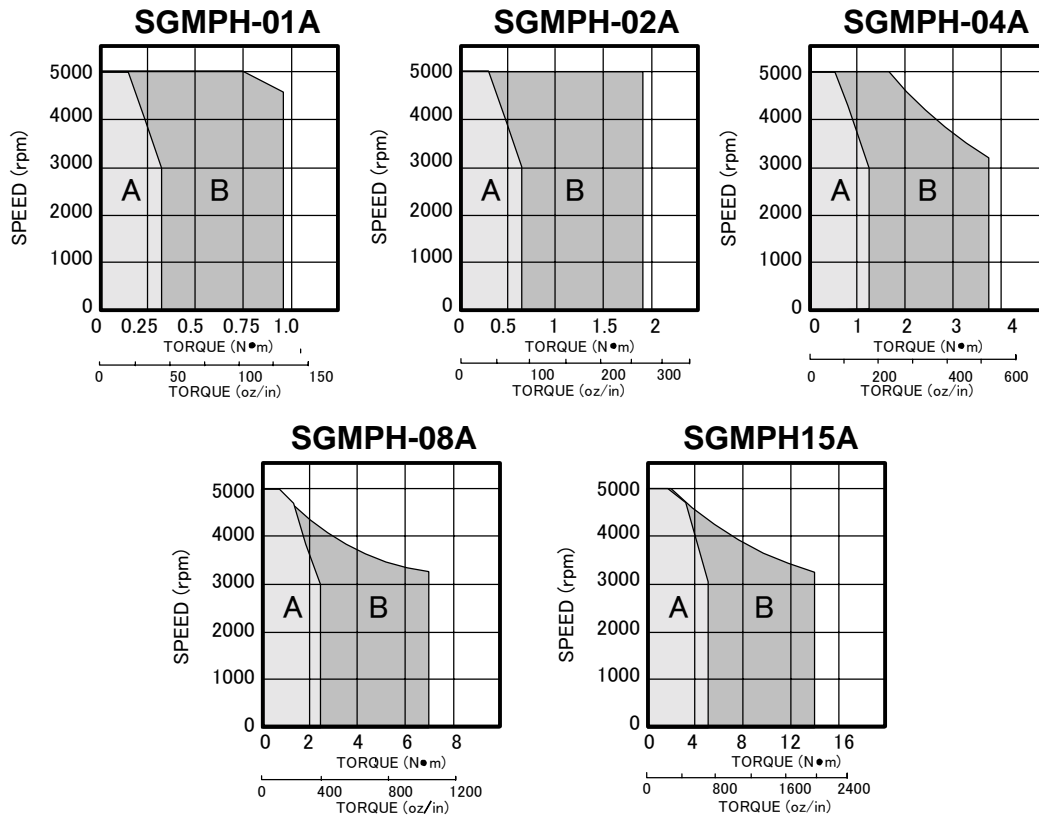
System Voltage	MOTORS SGMPH-	Moment of Inertia				Holding Brake (at 20°C)			Allowable Load Inertia *
		Motor without Brake		Motor with Brake		Capacity	Coil Resistance	Rated Current	
		oz · in · s ² × 10 ⁻³	KG · m ² × 10 ⁻⁴	oz · in · s ² × 10 ⁻³	KG · m ² × 10 ⁻⁴	W	Ω	A	
200V _{ac}	01A	0.695	0.0491	1.106	0.0781	6	96	0.25	1.20
	02A	2.73	0.193	4.274	0.302	5	115	0.21	3.69
	04A	4.69	0.331	6.234	0.44	7.6	76	0.32	3.82
	08A	29.7	2.10	42.09	2.975	7.5	77	0.31	13.4
	15A	56.9	4.02	69.29	4.895	10	58	0.42	24.1
100V _{ac}	01B	0.695	0.0491	1.106	0.0781	6	96	0.25	1.20
	02B	2.73	0.193	4.274	0.302	5	115	0.21	3.69
	04A	4.69	0.331	6.234	0.44	7.6	76	0.32	3.82

* Allowable load inertia (J_L) shows the range requiring no exterior regenerative unit. When these values are exceeded, application may be restricted or a regenerative unit may be required. Values are calculated when the servomotor is combined with an SGDh servo amplifier.

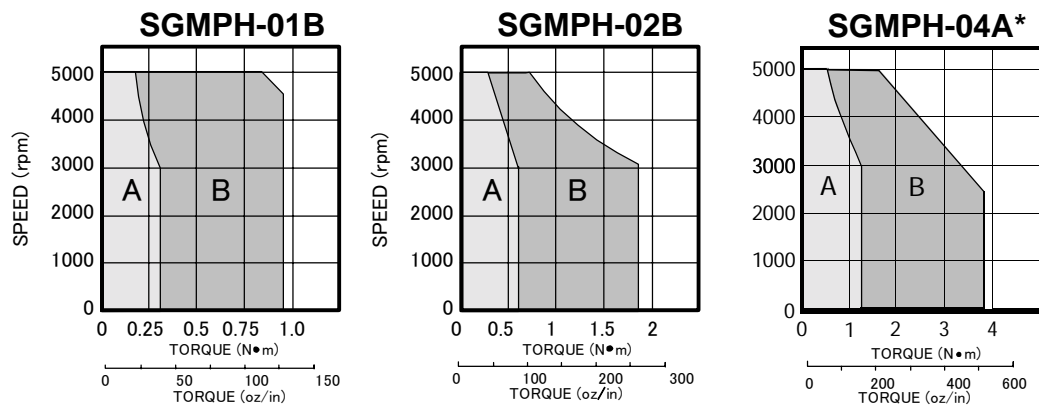
MOTORS SGMPH-	Servomotor Capacity W	Holding Brake	
		Holding Torque	
		oz-in	KG · cm
01□	100	69.5	5.0
02□	200	139	10
04A	400	279	20
08A	750	514	37
15A	1500	1015	73

Speed / Torque Curves

200V



100V



A : CONTINUOUS DUTY ZONE

B : INTERMITTENT DUTY ZONE

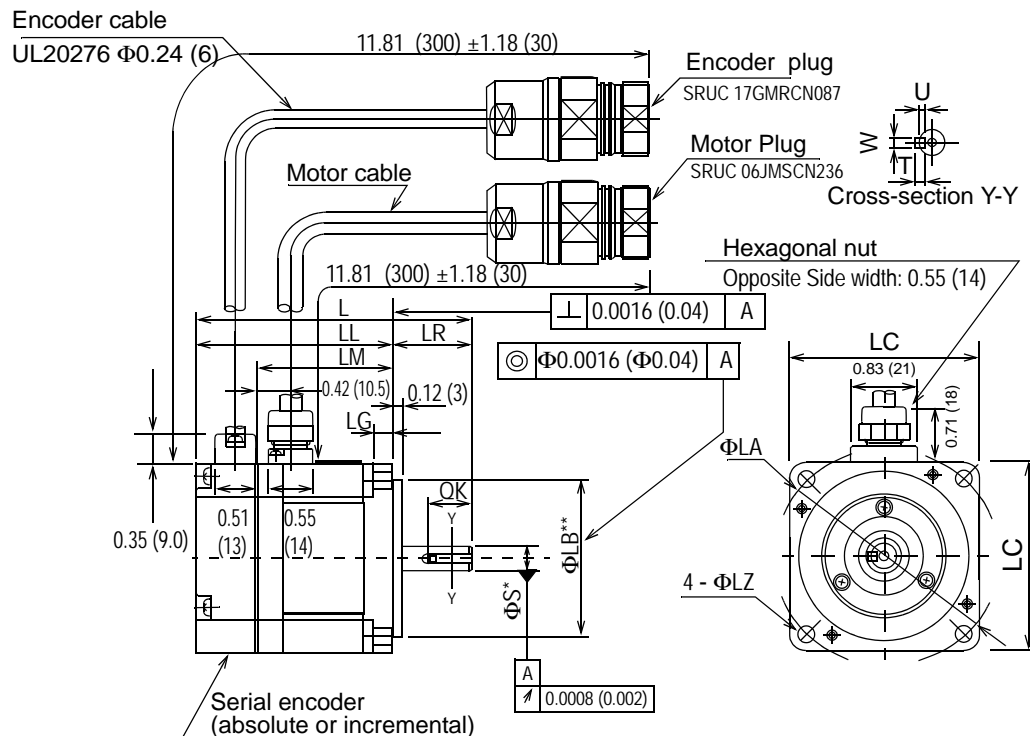
*When combined with SGD4FE amplifier.

Dimensions in inches (mm)

(1) 13-Bit Incremental or 16-Bit Absolute Encoder, w/o Brake

- Note:
1. The keyway complies with JIS B1301-1976 (precision). A straight key is supplied.
 2. Conforms to the IP67 enclosure, excluding the shaft (optional shaft seal available).
 3. The quoted allowable radial load is the value at a position 5mm (0.2in) from the shaft end.

• 100W (0.13hp)



Type SGMFH	L	LL	LM	LR	LG	LC	ΦLA	ΦLZ	ΦS*	ΦLB**	Key				Output W (hp)	Torque in-lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
											OK	U	W	T							
01□□E41D	3.43	2.44	1.67	0.98	0.24	2.36	2.76	0.21	0.315	1.97	0.55	0.071	0.12	0.12	100	2.81	Continuous	3000	1.54	17.5	11.0
01□□E41D	(87)	(62)	(42.5)	(25)	(6)	(60)	(70)	(5.3)	(8)	(50)	(14)	(1.8)	(3)	(3)	(0.13)	(0.318)			(0.7)	(78)	(49)

Note: The quoted allowable radial load is the value at a position 0.79in (20mm) from the mounting surface.

†Some motor dimensions vary for motors with the optional shaft seal: See p.38 for details.

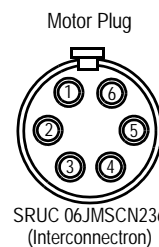
Specified Tolerances				
Dimension	*ΦS		**ΦLB	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.3150	+0.0000-0.0004	1.9685	+0.0000-0.0010
mm	8.000	+0.000-0.009	50.000	+0.000-0.025



Incremental Terminal Specifications		
Pin No.	Description	Color
1*	Battery -	—
2*	Battery + (3.6V)	—
3	Data +	Blue
4	Data -	Blue/White
5 - 7, 10 - 17	Free	—
8	+5V (Power Supply)	Red
9	0V (Power Supply)	Black
Connector Case	FG (Frame Ground)	Shield wire

*Note: Incremental Terminal pins number 1 and 2 are connectors used for 16-bit absolute encoder option only.

Mating Connector: SPNA17HFRON16900E3 (Interconnector)

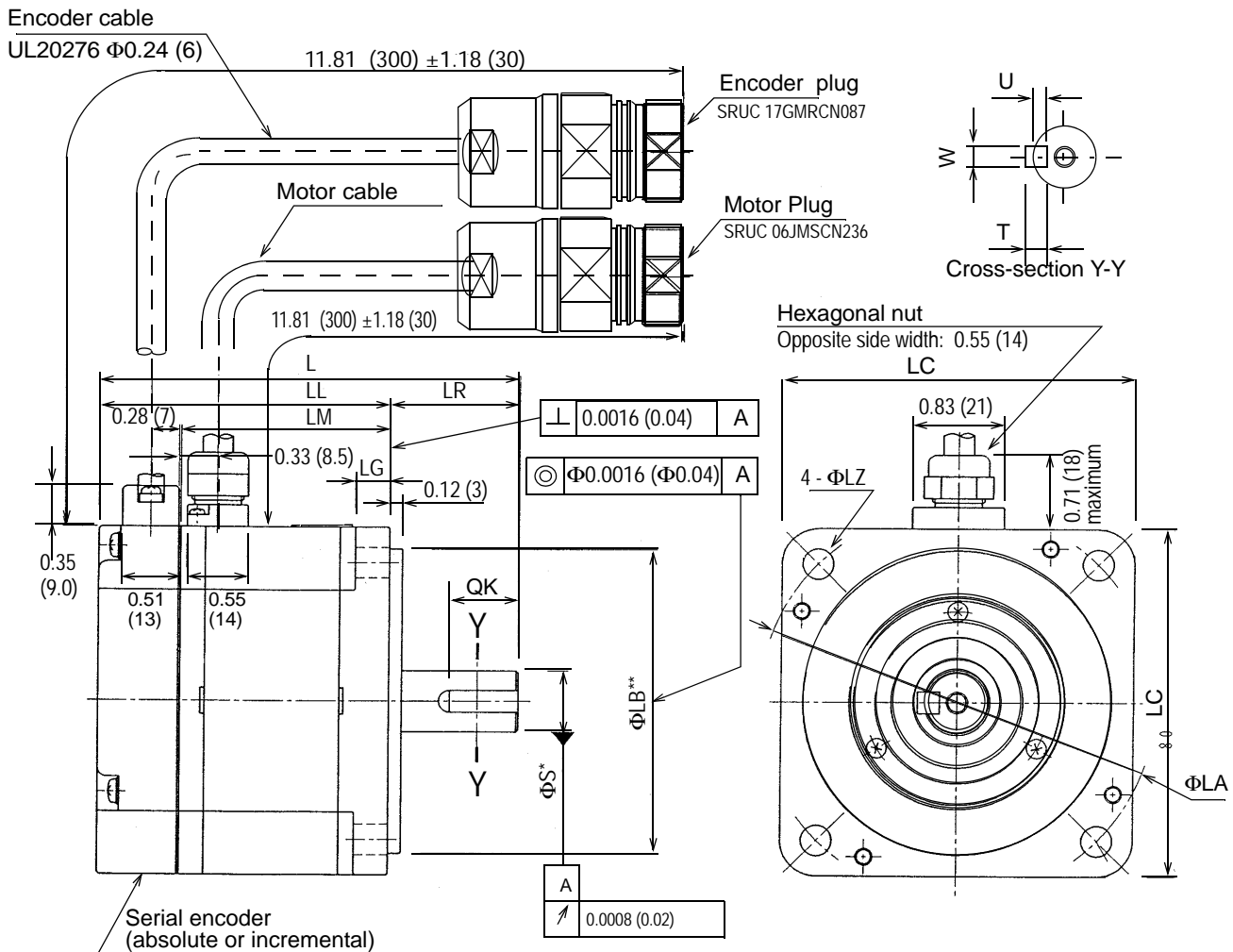


Motor Wiring Specifications		
Pin Number	Description	Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
6	FG (Frame Ground)	Green/Yellow

Mating Connector: SPNA06KFSDN169 (Interconnector)

100/200V Single-phase Sigma II Servo Systems

- 200W (0.27hp), 400W (0.53hp)



SGMPH
Servomotors

Type SGMPH-	L	LL	LM	LR	LG	LC	ΦLA	ΦLZ	ΦS^*	ΦLB^{**}	Key				Voltage V	Output W (hp)	Torque in-lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
											QK	U	W	T								
02□□E41D	3.82 (97)	2.64 (67)	1.89 (48.1)	1.18 (30)	0.31 (8)	3.15 (80)	3.54 (90)	0.28 (7)	0.551 (14)	2.76 (70)	0.63 (16)	0.12 (3)	0.20 (5)	0.20 (5)	200	200 (0.27)	5.64 (0.637)	Continuous	3000	3.09 (1.4)	55.1 (245)	15.4 (68)
04□□E41D	4.61 (117)	3.46 (87)	2.68 (68.1)													400 (0.53)	11.2 (1.27)			4.63 (2.1)		

Note: The quoted allowable radial load is the value at a position 0.98in (25mm) from the mounting surface.

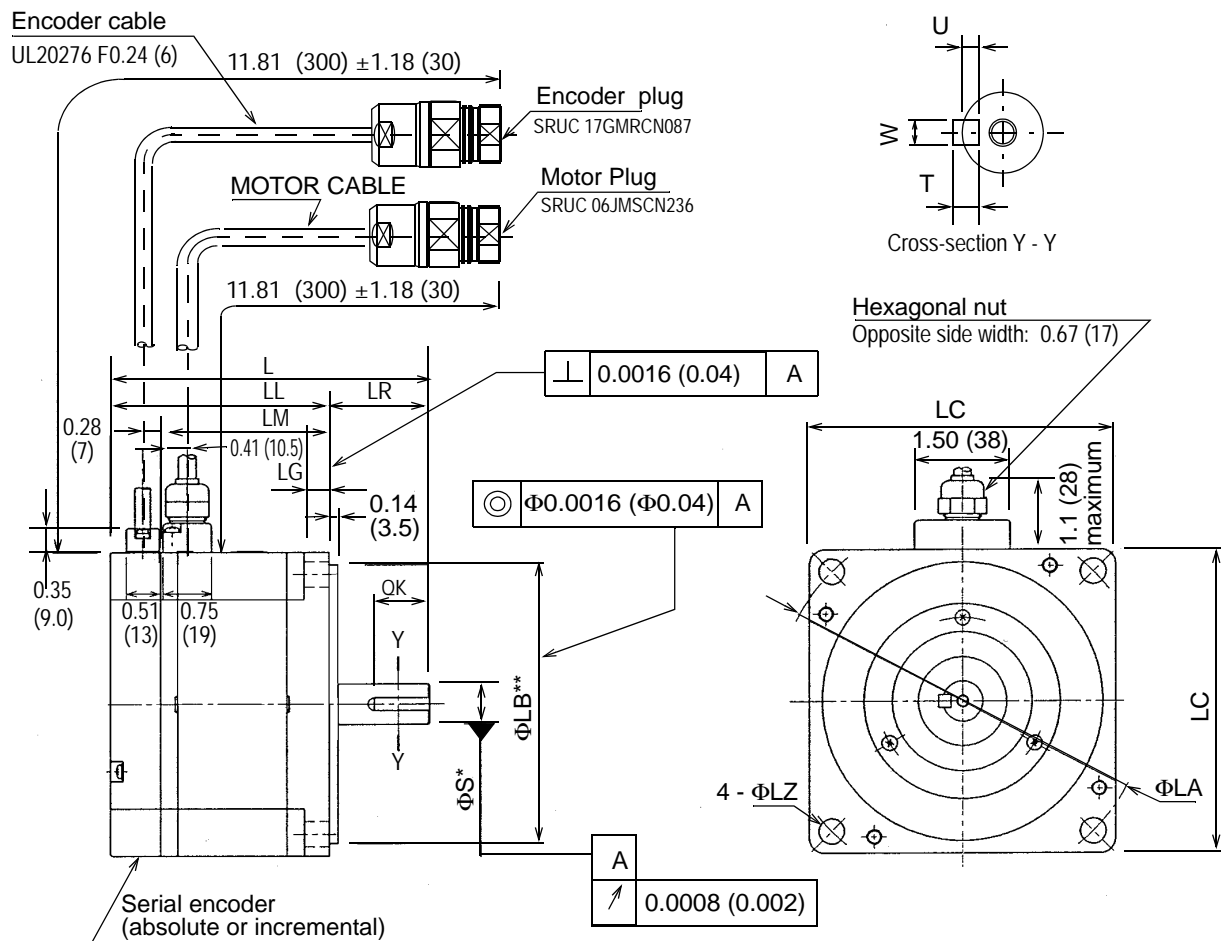
†Some motor dimensions vary for motors with the optional shaft seal: See p.38 for details.

Specified Tolerances				
Dimension	ΦS		ΦLB	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.5512	+0.0000-0.0004	2.7559	+0.0000 -0.0012
mm	14.000	+0.000 -0.011	70.000	+0.000 -0.030

Interconnection Connector Specifications: See p.30.

100/200V Single-phase Sigma II Servo Systems

• 750W (1.01hp)



Type SGMFH	L	LL	LM	LR	LG	LC	Φ LA	Φ LZ	Φ S*	Φ LB**	Key				Voltage V	Output W (hp)	Torque in·lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
											QK	U	W	T								
08□E41D	4.98 (126.5)	3.41 (86.5)	2.63 (66.7)	1.57 (40)	0.39 (10)	4.72 (120)	5.71 (145)	0.39 (10)	0.63 (16)	4.33 (110)	0.87 (22)	0.12 (3)	0.20 (5)	0.20 (5)	200	750 (1.01)	21.1 (2.39)	Continuous	3000	9.26 (4.2)	88.1 (392)	33.0 (147)

Note: The quoted allowable radial load is the value at a position 1.38in (35mm) from the motor mounting surface.

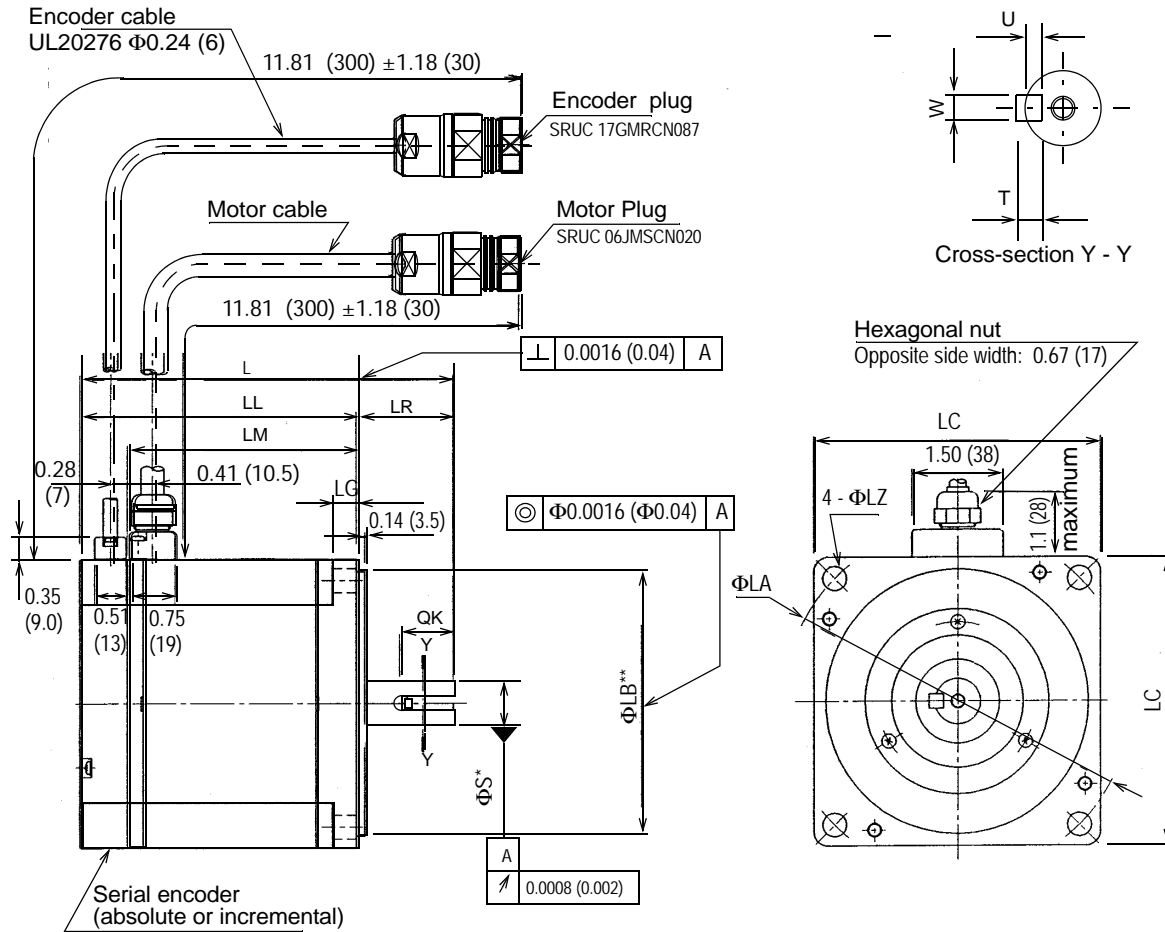
†Some motor dimensions vary for motors with the optional shaft seal: See p.38 for details.

Specified Tolerances				
Dimension	* Φ S		** Φ LB	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.6299	+0.0000-0.0004	4.3307	+0.0000-0.0014
mm	16.000	+0.000-0.011	110.000	+0.000-0.035

Interconnection Connector Specifications: See p.30.

100/200V Single-phase Sigma II Servo Systems

• 1500W (2.0hp)



Type SGMPH-	L	LL	LM	LR	LG	LC	ΦL_A	ΦL_Z	ΦS^*	ΦL_B^{**}	Key				Voltage V	Output W (hp)	Torque in·lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
											QK	U	W	T								
15□□E41D	6.08 (154.5)	4.51 (114.5)	3.73 (94.7)	1.57 (40)	0.39 (10)	4.72 (120)	5.71 (145)	0.39 (10)	0.75 (19)	4.33 (110)	0.87 (22)	0.14 (3.5)	0.24 (6)	0.24 (6)	200	1500 (2.0)	42.1 (4.77)	Continuous	3000	14.55 (6.6)	110 (490)	33.0 (147)

Note: The quoted allowable radial load is the value at a position 1.38in (35mm) from the motor mounting surface.

†Some motor dimensions vary for motors with the optional shaft seal: See p.38 for details.

Specified Tolerances				
Dimension	ΦS		ΦL_B^{**}	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.7480	+0.0000-0.0005	4.3307	+0.0000-0.0014
mm	19.000	+0.000-0.013	110.000	+0.000-0.035

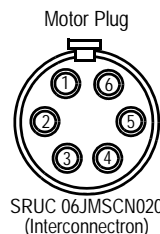
Interconnection Connector Specifications



Incremental Terminal Specifications		
Pin Number	Description	Color
1*	Battery -	—
2*	Battery * (3.6V)	—
3	Data +	Blue
4	Data -	Blue/White
5 - 7, 10 - 17	Free	—
8	+5V (Power Supply)	Red
9	0V (Power Supply)	Black
Connector Case	FG (Frame Ground)	Shield wire

*Note: Incremental Terminal pins number 1 and 2 are connectors used for 16-bit absolute encoder option only.

Mating Connector: SPNA17HFRON16900E3
(Interconnection)



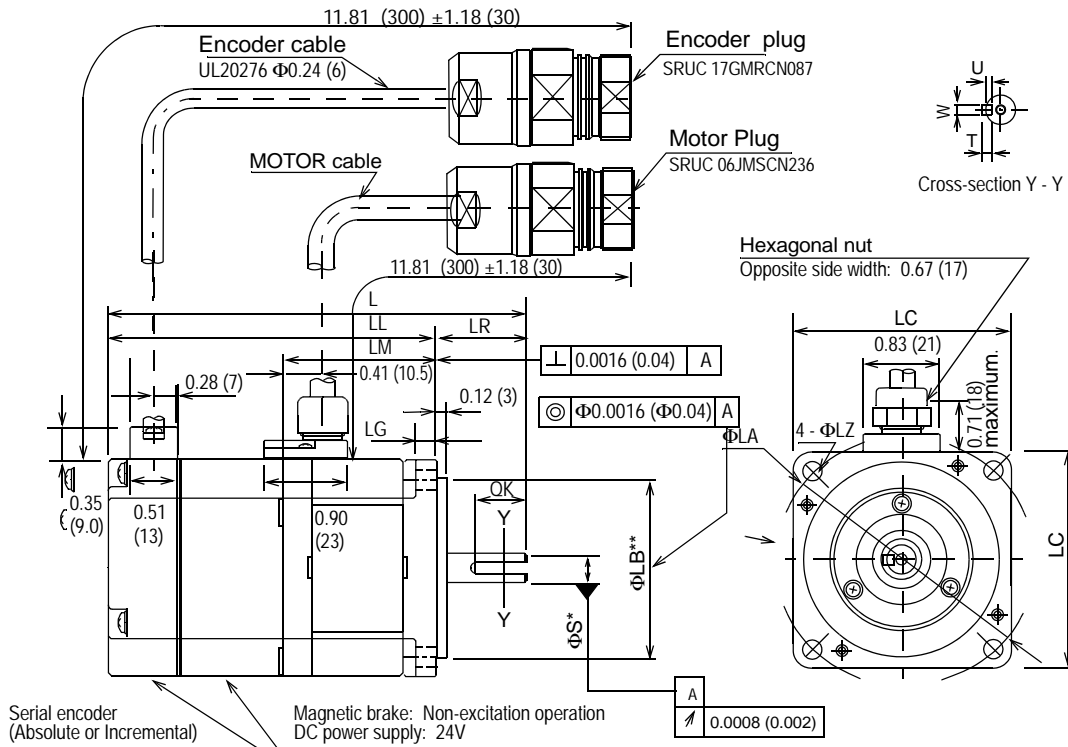
Motor Wiring Specifications		
Pin No.	Description	Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
6	FG (Frame Ground)	Green/Yellow

Mating Connector: SPNA06KFSDN169
(Interconnection)

(2) 13-Bit Incremental or 16-Bit Absolute Encoder, with Brake

- Note:
- 1. The keyway complies with JIS B1301-1976 (precision). A straight key is supplied.
 - 2. The electromagnetic brake is only to hold the load in position and cannot be used to stop the motor.
 - 3. Conforms to the IP67 enclosure, excluding the shaft (optional shaft seal available).

• 100W (0.13hp)



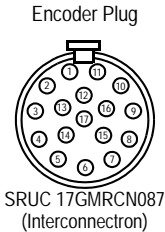
Type SGMPH-	L	LL	LM	LR	LG	LC	ΦLA	ΦLZ	ΦS*	ΦLB**	Key				Voltage (V)	Output W (hp)	Torque in·lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
											QK	U	W	T								
01□E4CD	4.57 (116)	3.58 (91)	1.67 (42.5)	0.98 (25)	0.24 (6)	2.36 (60)	2.76 (70)	0.22 (5.5)	0.315 (8)	1.968 (50)	0.55 (14)	0.071 (1.8)	0.12 (3)	0.12 (3)	200	100 (0.13)	2.81 (0.318)	Continuous	3000	1.5 (0.7)	17.5 (78)	11.0 (49)

Note: The quoted allowable radial load is the value at a position 0.79in (20mm) from the motor mounting surface.

†Some motor dimensions vary for motors with the optional shaft seal: See p.38 for details.

Specified Tolerances				
Dimension	*ΦS		**ΦLB	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.3150	+0.0000-0.0004	1.9685	+0.0000 -0.0010
mm	8.000	+0.000 -0.009	50.000	+0.000 -0.025

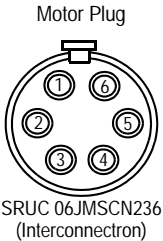
Interconnection Connector Specifications



Incremental Terminal Specifications		
Pin Number	Description	Color
1*	Battery -	-
2*	Battery + (3.6V)	-
3	Data +	Blue
4	Data -	Blue/White
5 - 7, 10 - 17	Free	-
8	+5V (Power Supply)	Red
9	0V (Power Supply)	Black
Connector Case	FG (Frame Ground)	Shield wire

*Note: Incremental Terminal pins number 1 and 2 are connectors used for 16-bit absolute encoder option only.

Mating Connector: SPNA17HFRON16900E3 (Interconnector)

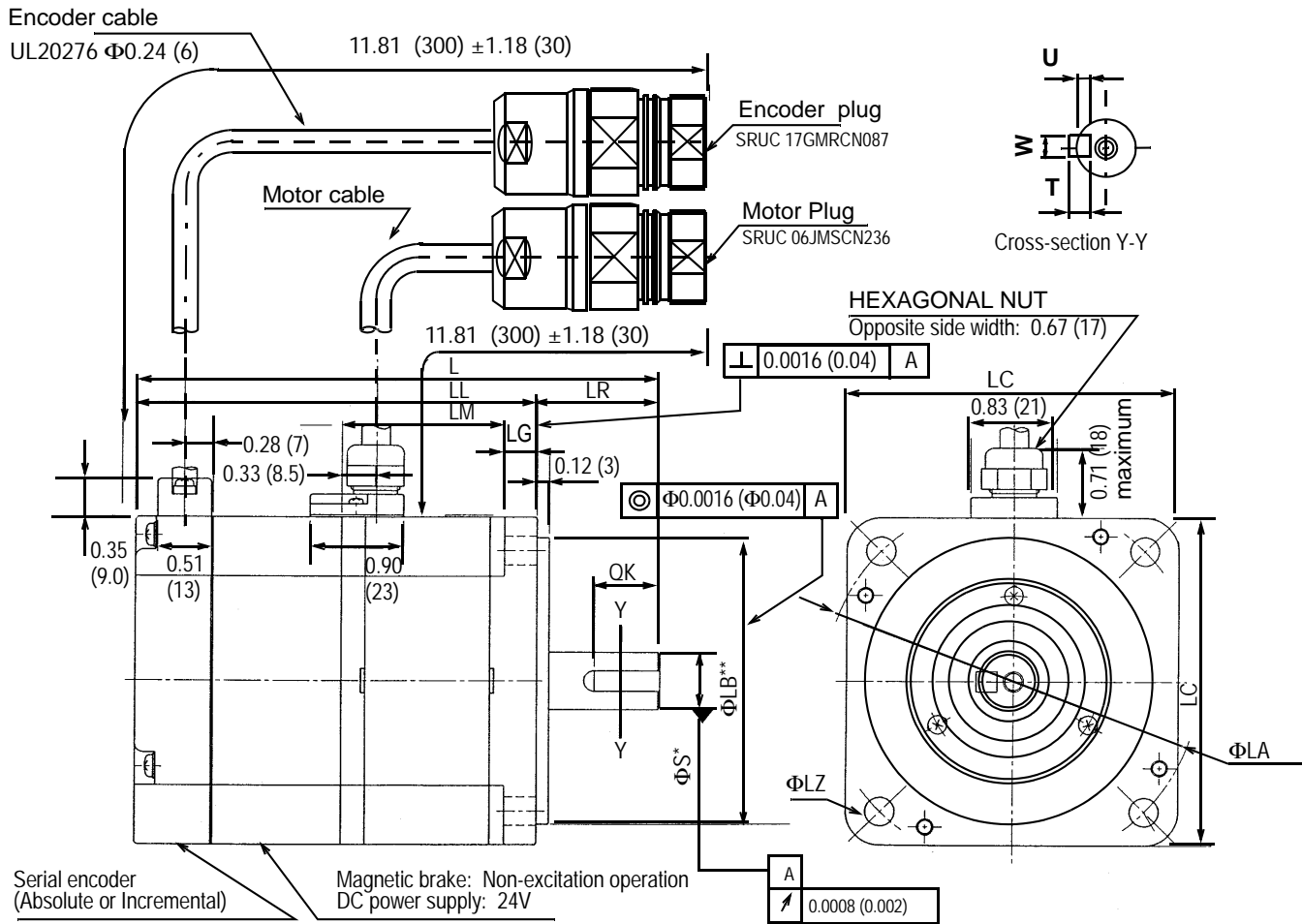


Motor Wiring Specifications		
Pin Number	Description	Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Holding Brake	Black
5	Holding Brake	Black
6	FG (Frame Ground)	Green/Yellow

Mating Connector: SPNA06KFSDN169 (Interconnector)

100/200V Single-phase Sigma II Servo Systems

- 200W (0.27hp), 400W (0.53hp)



Type SGMPH-	L	LL	LM	LR	LG	LC	ΦLA	ΦLZ	ΦS^*	ΦLB^{**}	Key				Voltage V	Output W (hp)	Torque in·lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
											QK	U	W	T								
02□□E4CD	5.06 (128.5)	3.88 (98.5)	1.89 (48.1)	1.18 (30)	0.31 (8)	3.15 (80)	3.54 (90)	0.28 (7)	0.551 (14)	2.756 (70)	0.63 (16)	0.12 (3)	0.20 (5)	0.20 (5)	200	200 (0.27)	5.64 (0.637)	Continuous	3000	4.2 (1.9)	55.1 (245)	15.29 (68)
04□□E4CD	5.85 (148.5)	4.67 (118.5)	2.68 (68.1)												400	400 (0.53)	11.2 (1.27)			5.7 (2.6)		

Note: The quoted allowable radial load is the value at a position 0.98in (25mm) from the motor mounting surface.

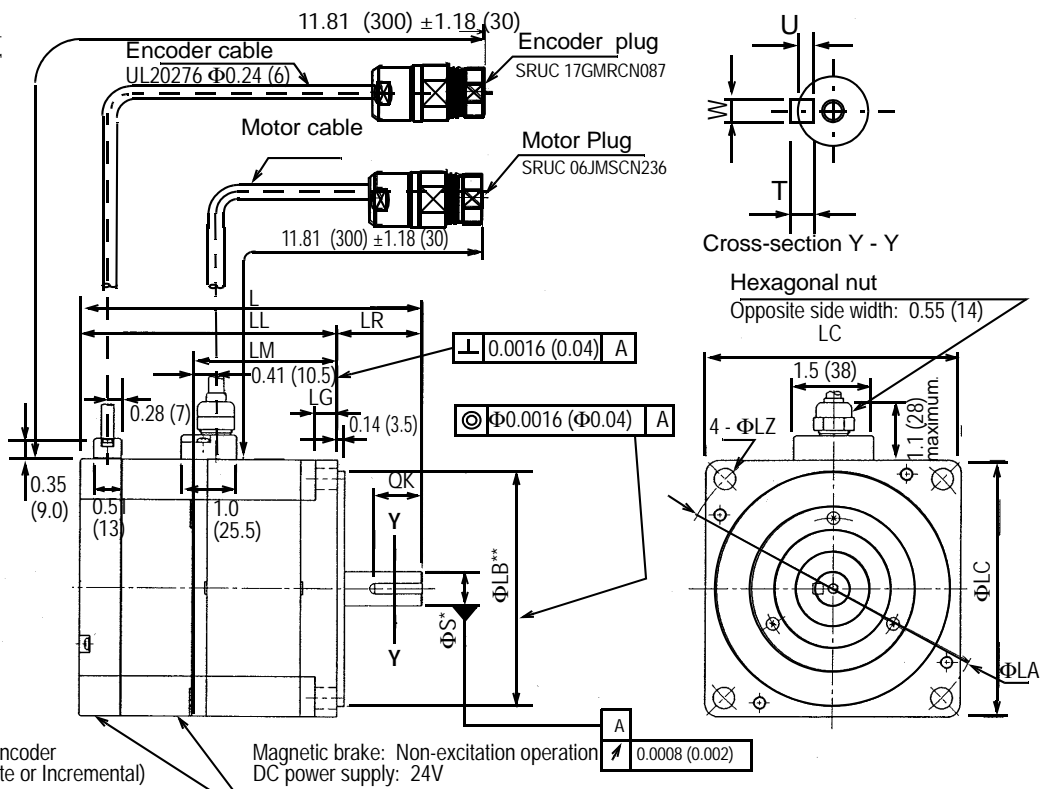
†Some motor dimensions vary for motors with the optional shaft seal: See p.38 for details.

Specified Tolerances				
Dimension		* ΦS		** ΦLB
Unit		Diameter	Tolerance	Diameter
in		0.5512	+0.0000-0.0004	2.7559
mm		14.000	+0.000-0.011	70.000

Interconnection Connector Specifications: See p.33.

100/200V Single-phase Sigma II Servo Systems

- 750W (1.01hp)



Type SGMPH-	L	LL	LM	LR	LG	LC	$\Phi L A$	$\Phi L Z$	ΦS^*	$\Phi L B^{**}$	Key				Voltage V	Output W (hp)	Torque in-lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
											QK	U	W	T								
08□□E4CD	6.42 (163)	4.84 (123)	2.63 (66.7)	1.57 (40)	0.39 (10)	4.72 (120)	5.71 (145)	0.39 (10)	0.63 (16)	4.33 (110)	0.87 (22)	0.12 (3)	0.20 (5)	0.20 (5)	200	750 (1.01)	21.15 (2.39)	Continuous	3000	12.6 (5.7)	88.1 (392)	33.0 (147)

Note: The quoted allowable radial load is the value at a position 1.38in (35mm) from the motor mounting surface.

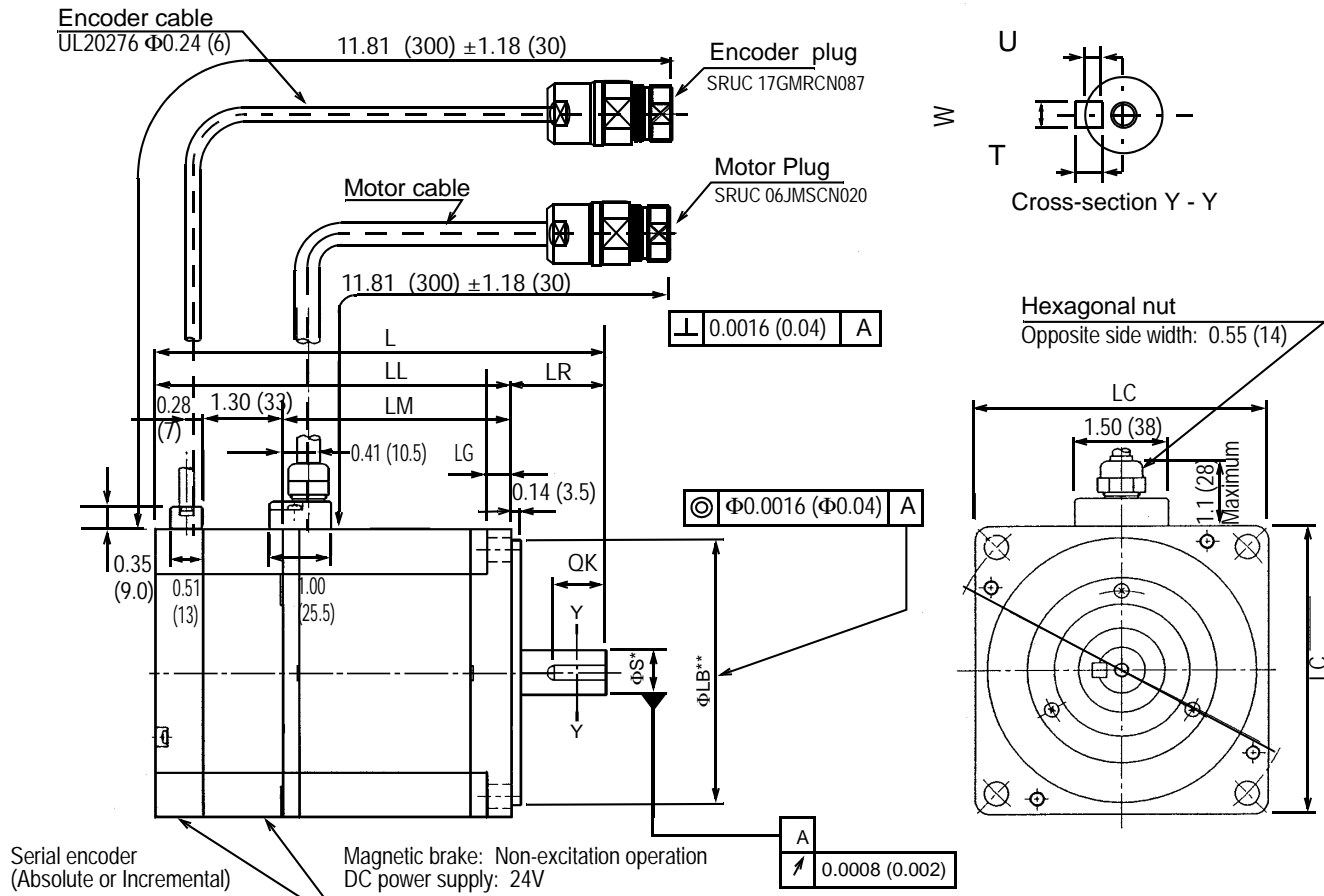
†Some motor dimensions vary for motors with the optional shaft seal: [See p.38](#) for details.

Specified Tolerances				
Dimension	ΦS		$\Phi L B$	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.6299	+0.0000-0.0004	4.3307	+0.0000-0.0014
mm	16.000	+0.000-0.011	110.000	+0.000-0.035

Interconnection Connector Specifications: [See p.33](#).

100/200V Single-phase Sigma II Servo Systems

• 1500W (2.0hp)



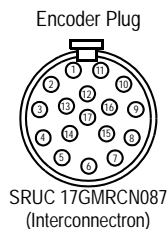
Type SGMPH-	L	LL	LM	LR	LG	LC	ΦLA	ΦLZ	ΦS^*	ΦLB^{**}	Key				Voltage V	Output W (hp)	Torque in-lb (N·m)	Time Rating	Rated Speed (rpm)	Approx Mass lb (kg)	Allowable Radial Load lb (N)	Allowable Thrust Load lb (N)
15□□E4CD	7.40 (188)	5.83 (148)	3.73 (94.7)	1.57 (40)	0.39 (10)	4.72 (120)	5.71 (145)	0.39 (10)	0.75 (19)	4.33 (110)	0.87 (22)	0.14 (3.5)	0.24 (6)	0.24 (6)	200	1500 (2.02)	42.1 (4.77)	Contin- uous	3000	17.9 (8.1)	110 (490)	33.0 (147)

Note: The quoted allowable radial load is the value at a position 1.38in (35mm) from the motor mounting surface.

†Some motor dimensions vary for motors with the optional shaft seal: See p.38 for details.

Specified Tolerances				
Dimension	ΦS		ΦLB	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.7480	+0.0000-0.0005	2.7559	+0.0000-0.0014
mm	19.000	+0.000-0.013	70.000	+0.000-0.035

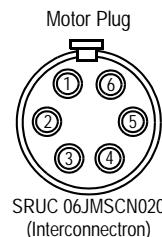
Interconnection Connector Specifications



Incremental Terminal Specifications		
Pin Number	Description	Color
1*	Battery -	—
2*	Battery + (3.6V)	—
3	Data +	Blue
4	Data -	Blue/White
5 - 7, 10 - 17	Free	—
8	+5V (Power Supply)	Red
9	0V (Power Supply)	Black
Connector Case	FG (Frame Ground)	Shield wire

*Note: Incremental Terminal pins number 1 and 2 are connectors used for 16-bit absolute encoder option only.

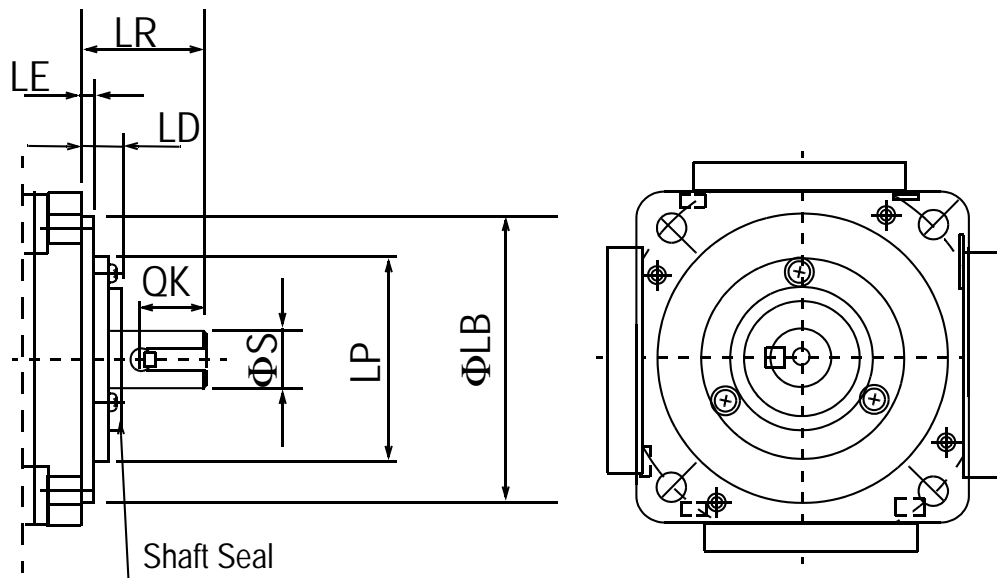
Mating Connector: SPNA17HFRON16900E3
(Interconnection)



Motor Wiring Specifications		
Pin No.	Description	Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Holding Brake	Black
5	Holding Brake	Black
6	FG (Frame Ground)	Green/Yellow

Mating Connector: SPNA06KFSDN169
(Interconnection)

Dimension Modifications for Motors with Optional Shaft Seal



Type SGMPH-	QK	ΦLB^*	ΦS^*	LE	LR	LD	ΦLP
01	0.55 (14)	1.97 (50)	0.31 (8)	0.12 (3)	0.98 (25)	0.28 (7)	1.54 (39)
02	0.64 (16)	2.76 (70)	0.55 (14)		1.18 (30)	0.39 (10)	1.93 (49)
04							
08	0.87 (22)	4.33 (110)	0.63 (16)	0.14 (3.5)	1.57 (40)	0.41 (10.5)	3.03 (77)
15			0.75 (19)				

*Refer to the following table for tolerances for diameters LB and S.

Specified Tolerances				
Dimension	$^*\Phi S$		$^{**}\Phi LB$	
Unit	Diameter	Tolerance	Diameter	Tolerance
in	0.3150	+0.0000-0.0004	1.9685	+0.0000 -0.0010
	0.5512	+0.0000-0.0004	2.7559	+0.0000 -0.0014
	0.6299	+0.0000-0.0004	4.3307	+0.0000 -0.0014
	0.7480	+0.0000-0.0005		
mm	8.000	+0.000 -0.009	50.000	+0.000 -0.025
	14.000	+0.000 -0.011	70.000	+0.000 -0.035
	16.000	+0.000 -0.011	110.000	+0.000 -0.035
	19.000	+0.000 -0.013		

Torque Reduction Factor for SGMPH motors equipped with a shaft seal:

Servo Motor Model	01	02	04	08	15
Torque Reduction Factor	90%	90%	95%	95%	95%

For Example: The SGMPH-01 continuous and peak torque rating should be reduced to 90% of the listed catalog specification.

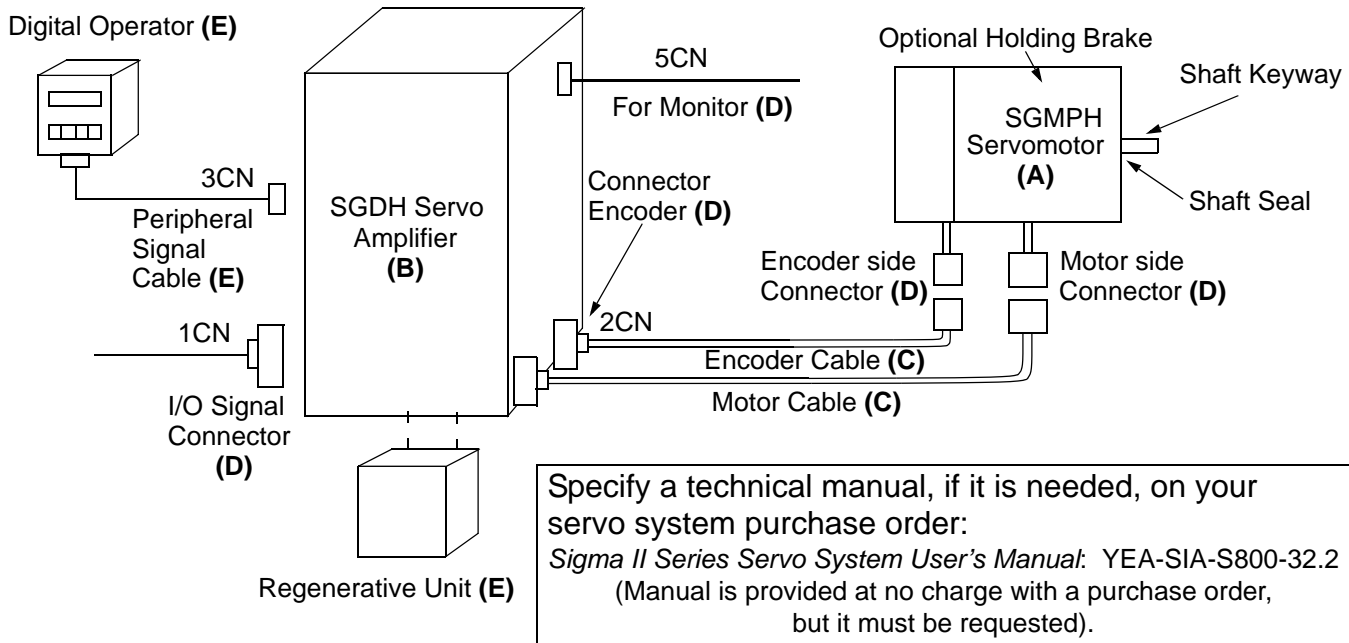
To specify a motor with a shaft seal, refer to the motor part number explanation on the following page.

Selecting Your SGMPH Sigma II Servo System

First, select the Sigma II servomotor suited for your application using SigmaSize: the Yaskawa servomotor sizing software, available at no charge. (Request SigmaSize software via e-mail, at: literature@yaskawa.com).

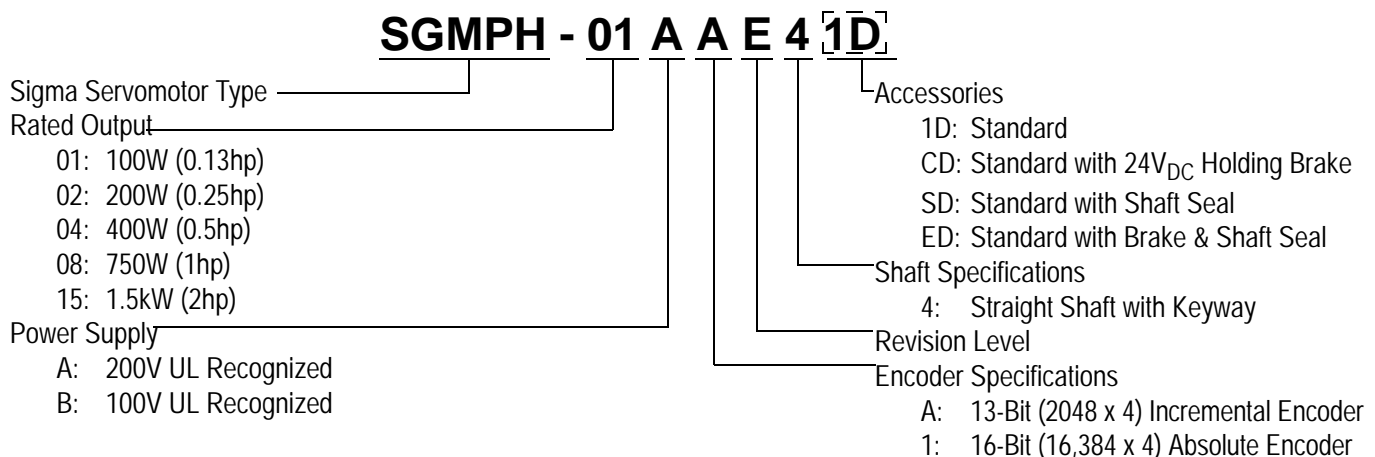
Use the diagram below to locate and identify the components of your system. Each item is letter-coded and cross-referenced in the option tables on the following pages.

System Configuration



SGMPH Servomotors

Model Number Designation



Servomotor & Amplifier Selection

Use the table below to select the appropriate SGMPH Sigma II servomotor and amplifier.
(Refer to the motor model # designation on the previous page specifying the available modification to motor construction/features.)

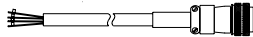
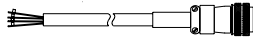
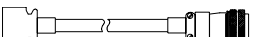
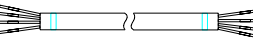
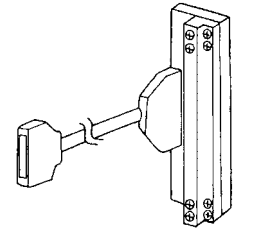
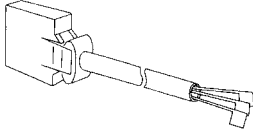
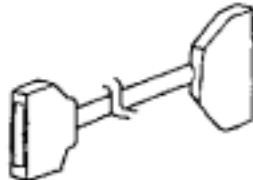
Description	Peak Torque (oz • in)	Rated Torque (oz • in)	Motor Inertia (oz • in • s ² x10 ⁻³)	Motor MODEL # (A)	Amplifier MODEL # (B)*		Motor & Amplifier Item Class
					1-Phase SGDH-	3-Phase SGDH-	
200V 13-Bit Incremental Encoder Straight Shaft with Keyway 5000rpm Pre-wired with Heavy Duty Connectors	135	45.1	0.917	SGMPH-01AAE41D	01AE	—	Stock
			1.46	SGMPH-01AAE4CD			
	270	90.1	2.96	SGMPH-02AAE41D	02AE	—	
			4.35	SGMPH-02AAE4CD			
	542	181	4.92	SGMPH-04AAE41D	04AE	—	
			6.31	SGMPH-04AAE4CD			
	1010	338	29.9	SGMPH-08AAE41D	08AE-S	08AE	
			35.7	SGMPH-08AAE4CD			
	2027	676	57.1	SGMPH-15AAE41D	15AE-S	15AE	
			67.8	SGMPH-15AAE4CD			
100V, 1-Phase 13-Bit Incremental Encoder Straight Shaft with Keyway 5000rpm Pre-wired with Heavy Duty Connectors	135	45.1	0.917	SGMPH-01BAE41D	01BE	—	
			1.46	SGMPH-01BAE4CD			
	270	90.1	2.96	SGMPH-02BAE41D	02BE	—	
			4.35	SGMPH-02BAE4CD			
	542	181	4.92	SGMPH-04AAE41D	04FE	—	
			6.31	SGMPH-04AAE4CD			

Notes: 24V_{DC} brakes for SGMPH Sigma II servomotors are standard. Contact a local source for 24V_{DC} power supplies. Motor power and encoder cables are factory pre-wired with approximately 13" lead length with heavy duty mating connectors. Use the tables on the following page to specify mating connectors and/or various cable lengths. For technical information, request Yaskawa manual number YEA-SIA-S800-32.2.

* For more detailed SGDh amplifier specifications and dimensions, refer to pages 99 to 112.

Pre-wired Cable Selection

Use the table below to select pre-wired cables for your SGMPH Sigma II servomotor.

Cable Description (C)		Motor Size (kW)	Part Number*	Comments	Item Class
Power Cable with Intercon- nectron Connectors (without Brake)		0.1, 0.2, 0.4, 0.8	B4ICE-□□(A)	These UL and CE compli- ant cables are available in five lengths. Use two digits in the part number's last place: 03: 3m 05: 5m 10: 10m (standard) 15: 15m 20: 20m	Stock**
		1.5	B5ICE-□□(A)		
Power Cable with Intercon- nectron Connectors (with Brake) (IP67)		0.1, 0.2, 0.4, 0.8	B4IBCE-□□(A)		
		1.5	B5IBCE-□□(A)		
Encoder Cable with Intercon- nectron Connector (incremental or absolute) (IP67)		All	A1ICE-□□(A)		
Encoder Cable (for applications up to 20m) Only for Solder Connections			FR-RMCT-SB	These cables are avail- able in any length. For example, to order one FR-RMCT-SB cable, 16m long, specify: quantity: 16 part no.: FR-RMCT-SB	
Encoder Cable (for applications from >20 to <50m) Only for Solder Connections			UL20276-SB		
Input/Output 1CN Cable & Transition Terminal Block			JUSP-TA50P	35mm DIN rail mountable; the cable length is 0.5 meters.	
Input/Output 1CN Cable with Pigtail Leads			JZSP-CKI01-□(A)	Use the following key to specify required cable length (last digit of part number): 1: 1m (standard) 2: 2m 3: 3m	
Input/Output 1CN Cable Cable with Female D-Sub output Connector***				JZSP-CKI0D-□□	

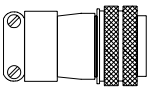
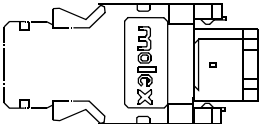
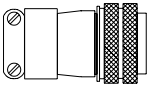

* The "(A)" at the end of the cable part number is the revision level. Revision level may be changed prior to catalog reprinting.

** Standard cable lengths are Stock items; non-standard cable lengths are Limited Stock items.

*** 50 Pin Female D-Sub output connector mates to customer supplied third party terminal block. (e.g., Wago #289-449, Weidmuller #919658, Phoenix #2283647, Amphenol/Sine #20-51039, and many others)



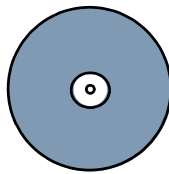
Connector Selection

Use the table below to select mating connectors or kits for your SGMPH Sigma II servomotor.

Connector Description (D)		Motor Size (kW)	Part Number	Comments	Item Class
Interconnectron Connector for Motor Power Cable (with or without Brake) (IP67)		0.1, 0.2, 0.4, 0.8, 1.5	FIN07S-B2	Solder Cup	Stock
2CN Amplifier Mating Connector			JZSP-CMP9-1	—	
Interconnectron Connector for Encoder Cable (incremental or absolute encoder) (IP67)			FIN17C-A2	Gauge: 24 - 18AWG Requires Crimp Tool B150 and positioner.	
1CN Mating Connector		All	JZSP-CKI9	—	Limited Stock
Interconnectron Crimp Tool	—		B150	—	
Positioner	—		B055/A	—	

Peripheral Device Selection

Use the table below to select peripheral devices for your SGMPH Sigma II servomotor.

Component	Description (E)	Part Number	Comments	Item Class
Hand-held Digital Operator Panel		JUSP-OP02A-1 and JZSP-CMS00-1	Portable unit with 1m adapter cable for Sigma II	Stock
Absolute Encoder Battery		JZSP-BA01	3.6V, 1000mAh (lithium battery)	
Software Interface Cable	—	YS-12	Pre-wired 2.0m cable with 9-pin connector	
SigmaWin+ Software		JZSP-WP0001	Minimum Recommended System Requirements Pentium 200 MHz, 64MB RAM, 200MB hard drive, CDROM Drive, RS-232 or RS-422 port, Screen resolution 800x600 w/ 256 colors, and Windows 95,98,NT4.0,2000,ME. (Windows XP planned)	
Individual External Regenerative Unit	For: SGDH-01AE SGDH-02AE SGDH-04AE SGDH-08AE SGDF-08AE-S amps	RH12050ohmJ	These are general purpose regenerative units.* Caution: Proper set-up is necessary to avoid equipment damage.	Limited Stock
	For: SGDH-15AE SGDH-15AE-S	RH500N25_ohmK		
DC Reactor (for suppressing harmonics in the power supply)	For 200V: SGDH-01AE SGDH-02AE SGDH-04AE SGDH-08AE SGDF-08AE-S SGDH-15AE SGDH-15AE-S	X5071 X5070 X5069 X5061 X5079 X5060 X5078	—	
	For 100V: SGDH-01BE SGDH-02BE	X5063 X5062		

* For an alternate solution, specify the individual resistor part number RH500N25_OHMK in necessary series or parallel connection. Refer to the SGDH servo amplifier section of this catalog for additional specifications, and the *Sigma II Series Servo System User's Manual* (YEA-SIA-S800-32.2) for proper resistor sizing guidelines.

NOTES:

SGMPH Gearmotors - With Incremental / Absolute Encoder

Rated Output : 100W, 200W, 400W,
750W, 1500W



For Additional Information	Page(s)
SGMPH Gearmotor Ratings & Specifications	48 - 49
SGMPH Gearmotor Dimensions	50 - 51
SGMPH Gearmotor Selection/Ordering Information	52 - 55
SGDH Ratings & Specifications	99 - 100
SGDH Dimensions	101 - 112

Design Features

1. Compact Construction

- Easy to install - pre-engineered and pre-assembled
- Ideal for cyclic and reversing applications
- Fits in limited mounting space
- Planetary gear geometry allowing high output torques in a compact package

2. Torque

- 40.9 to 3540in • lb peak torque
- Cost-effective solution for low speed and high torque applications
- Gear ratios - 5:1 to 100:1 in some sizes
- High torsional stiffness and low backlash
- Lubrication is self-replenishing to ensure long life

3. Encoders

- 13-Bit (2,048ppr x 4) incremental encoder (standard)
- 16-Bit (16,384ppr x 4) absolute encoder (option)

4. Enclosure

- Motor is totally enclosed, self-cooled IP67 (not including shaft)

5. Application Emphasis

- PCB drilling machines
- Robots
- Conveyors
- Packaging machines

6. Certified International Standards

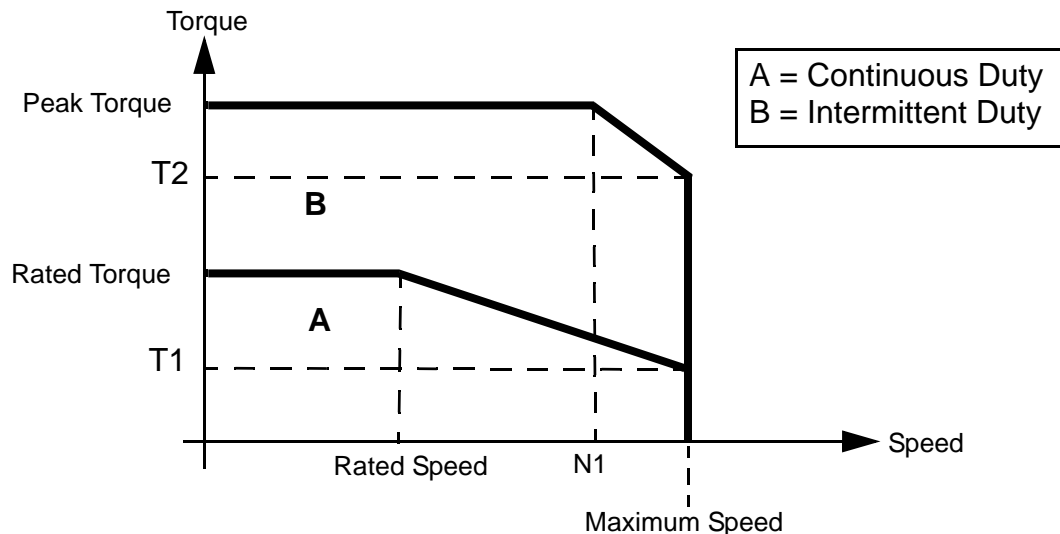
- UL, cUL recognized (File #: E165827), CE compliance

Gearmotor Ratings and Specifications

GEARMOTOR Part Number	Rated Torque (in • lb)	Peak Torque (in • lb)	Rated Speed (rpm)	Maximum Speed (rpm)	Speed N1 (rpm)	Torque T1 (in • lb)	Torque T2 (in • lb)	Amplifier Model Number
								Analog Input SGDH-
SG05SA-PE01□□	13.67	40.93	600	1000	900	8.59	34.34	01□□
SG10SA-PE01□□	27.34	81.84	300	500	450	17.17	68.68	
SG25SA-PE01□□	66.95	200.39	120	200	180	42.04	168.16	
SG50SA-PE01□□	133.89	283.00	60	100	90	84.08	336.32	
SG1ASA-PE01□□	267.78	637.00	30	50	45	168.16	672.65	
SG05SA-PE02□□	27.34	81.84	600	1000	1000/600	17.17	81.8/36.2*	02□□
SG10SA-PE02□□	54.68	163.69	300	500	500/300	34.34	163.7/72.4*	
SG25SA-PE02□□	133.89	283.00	120	200	200/120	84.08	283/177*	
SG50SA-PE02□□	267.78	708.00	60	100	100/60	168.16	708/354.7*	
SG1ASAPE02□□	535.56	1593.00	26	48	50/30	336.32	1593/704.4*	
SG05SA-PE04□□	54.81	164.42	600	1000	640	34.34	77.27	04□□
SG10SA-PE04□□	109.61	283.00	300	500	320	68.68	154.53	
SG25SA-PE04□□	268.38	708.00	120	200	128	168.16	378.36	
SG50SA-PE04□□	536.75	1610.25	52	96	64	336.32	756.73	
SG1ASA-PE04□□	1073.50	2832.00	20	36	32	672.65	1513.45	
SG05SA-PE08□□	102.34	306.04	600	1000	640	51.51	51.51	08□□
SG10SA-PE08□□	204.67	612.07	300	500	320	103.02	103.02	
SG25SA-PE08□□	501.13	1498.63	104	192	128	252.24	252.24	
SG50SA-PE08□□	1002.25	2997.25	40	72	64	504.48	504.48	
SG05SA-PE15□□	205.16	614.50	520	960	640	103.02	103.02	15□□
SG10SA-PE15□□	410.31	1228.99	260	480	320	206.04	206.04	
SG25SA-PE15□□	1004.63	3009.13	80	144	128	504.48	504.48	
SG50SA-PE15□□	2009.25	3540.00	40	72	64	1008.97	1008.97	

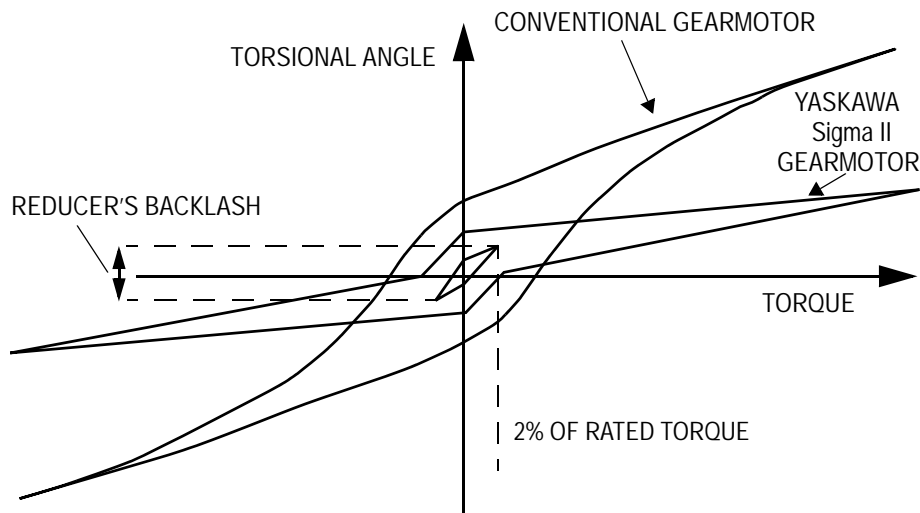
* Values for 100V Gearmotor

- Note: 1. These performance ratings apply when duty cycles are 60% or less, and when the gearmotor runs for 1,000 cycles per hour or less. Contact your Yaskawa representative when duty cycles exceed 60%, and when the gearmotor runs for more than 1,000 cycles per hour.
2. Rated Speed is at 20°C ambient temperature. Reduce Rated Speed by 20% at 40°C ambient temperature.
3. For right-angle gearmotors, please consult the factory for availability.

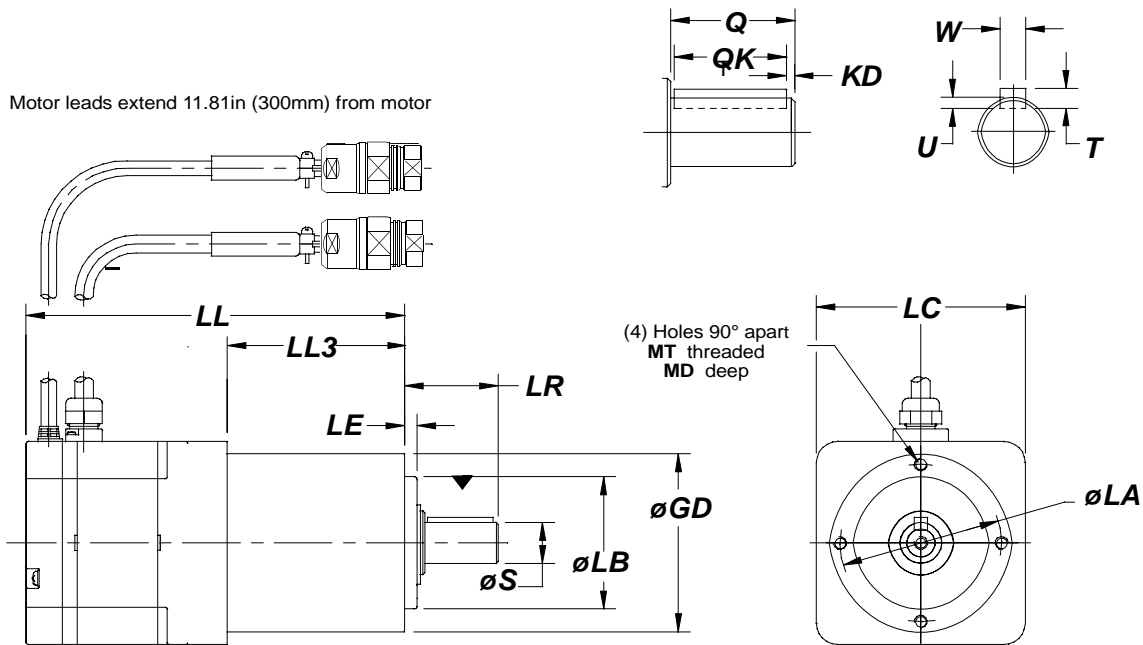


Gearmotor Mechanical Ratings

GEARMOTOR Part Number	Gearhead Backlash (arc min)	Gearhead Maximum Radial Load (lb _f)	Gearhead Maximum Axial Load (lb _f)	Gearhead Inertia (in • lb • s ²)	Gearmotor Weight (lb)
SG05SA-PE01□□	<10	146	158	0.000052	3.24
SG10SA-PE01□□					
SG25SA-PE01□□		326	349	0.00025	6.39
SG50SA-PE01□□					
SG1ASA-PE01□□		540	428	0.0016	12.79
SG05SA-PE02□□	<10	326	349	0.00025	7.28
SG10SA-PE02□□					7.94
SG25SA-PE02□□		540	428	0.0016	14.34
SG50SA-PE02□□					27.79
SG1ASA-PE02□□		1035	900	0.0049	
SG05SA-PE04□□	<10	326	349	0.00025	8.82
SG10SA-PE04□□					
SG25SA-PE04□□		540	428	0.0016	15.88
SG50SA-PE04□□		1035	900	0.0049	29.33
SG1ASA-PE04□□		1687	1350	0.0047	50.83
SG05SA-PE08□□	<10	540	428	0.0016	19.18
SG10SA-PE08□□					
SG25SA-PE08□□		1035	900	0.0049	34.84
SG50SA-PE08□□		1687	1350	0.0047	56.34
SG05SA-PE15□□	<10	1035	900	0.0048	34.40
SG10SA-PE15□□					
SG25SA-PE15□□		1687	1350	0.0047	60.75
SG50SA-PE15□□					



Dimensions in inches (mm)



GEARMOTOR	LL3	LL	LE	LR	LB	GD	S	LC	LA	MT	MD	Q	QK	KD	W	T	U
SG05SA-PE01□A	1.988 (50)	5.177 (131.5)	0.158 (4)	0.965 (24.5)	1.378 (35)	1.969 (50)	0.472 (12)	2.362 (60)	1.732 (44)	M4 x 0.7	0.315 (8)	0.709 (18)	0.551 (14)	0.079 (2)	0.158 (4)	0.158 (4)	0.098 (2.5)
SG10SA-PE01□A																	
SG25SA-PE01□A	3.465 (88)	6.858 (174.2)	0.197 (5)	1.417 (36)	2.047 (52)	2.756 (70)	0.630 (16)	2.756 (70)	2.441 (62)	M5 x 0.8	0.394 (10)	1.102 (28)	0.984 (25)		0.197 (5)	0.197 (5)	0.118 (3)
SG50SA-PE01□A																	
SG1ASA-PE01□A	4.193 (106.5)	7.500 (190.5)		1.811 (46)	2.677 (68)	3.543 (90)	0.866 (22)	3.543 (90)	3.150 (80)	M6 x 1.0	0.472 (12)	1.417 (36)	1.260 (32)		0.236 (6)	0.236 (6)	0.138 (3.5)
SG05SA-PE02□A	2.677 (68)	6.181 (157)		1.417 (36)	2.047 (52)	2.756 (70)	0.630 (16)	3.150 (80)	2.441 (62)	M5 x 0.8	0.394 (10)	1.102 (28)	0.984 (25)	0.079 (2)	0.197 (5)	0.197 (5)	0.118 (3)
SG10SA-PE02□A																	
SG25SA-PE02□A	3.465 (88)	6.969 (177)		1.811 (46)	2.677 (68)	3.543 (90)	0.866 (22)	3.543 (90)	3.150 (80)	M6 x 1.0	0.472 (12)	1.417 (36)	1.260 (32)		0.236 (6)	0.236 (6)	0.138 (3.5)
SG50SA-PE02□A	4.193 (106.5)	7.697 (195.5)															
SG1ASA-PE02□A	5.295 (134.5)	9.036 (229.5)	0.236 (6)	2.756 (70)	3.543 (90)	4.724 (120)	1.260 (32)	4.724 (120)	4.252 (108)	M8 x 1.25	0.630 (16)	2.284 (58)	1.969 (50)	0.158 (4)	0.394 (10)	0.315 (8)	0.197 (5)
SG05SA-PE04□A	2.677 (68)	6.969 (177)	0.197 (5)	1.417 (36)	2.047 (52)	2.756 (70)	0.630 (16)	3.150 (80)	2.441 (62)	M5 x 0.8	0.394 (10)	1.102 (28)	0.984 (25)	0.079 (2)	0.197 (5)	0.197 (5)	0.118 (3)
SG10SA-PE04□A																	
SG25SA-PE04□A	4.193 (106.5)	8.484 (215.5)		1.811 (46)	2.677 (68)	3.543 (90)	0.866 (22)	3.543 (90)	3.150 (80)	M6 x 1.0	0.472 (12)	1.417 (36)	1.260 (32)		0.236 (6)	0.236 (6)	0.138 (3.5)
SG50SA-PE04□A	5.295 (134.5)	9.823 (249.5)															
SG1ASA-PE04□A	6.024 (153)	10.551 (268.0)	0.315 (8)	3.819 (97)	4.724 (120)	6.102 (155)	1.575 (40)	4.724 (120)	5.512 (140)	M10 x 1.5	0.787 (20)	3.228 (82)	2.756 (70)	0.236 (6)	0.472 (12)	0.315 (8)	0.197 (5)
SG05SA-PE08□A	3.150 (80)	7.815 (198.5)	0.197 (5)	1.811 (46)	2.677 (68)	3.543 (90)	0.866 (22)		3.150 (80)	M6 x 1.0	0.472 (12)	1.417 (36)	1.260 (32)	0.079 (2)	0.236 (6)		
SG10SA-PE08□A																	
SG25SA-PE08□A	5.295 (134.5)	9.803 (249)	0.236 (6)	2.756 (70)	3.543 (90)	4.724 (120)	1.260 (32)		4.252 (108)	M8 x 1.25	0.630 (16)	2.284 (58)	1.969 (50)	0.158 (4)	0.394 (10)		
SG50SA-PE08□A	6.024 (153)	10.532 (267.5)	0.315 (8)	3.819 (97)	4.724 (120)	6.102 (155)	1.575 (40)		5.512 (140)	M10 x 1.5	0.787 (20)	3.228 (82)	2.756 (70)	0.236 (6)	0.472 (12)		
SG05SA-PE15□A	4.016 (102)	9.626 (244.5)	0.236 (6)	2.756 (70)	3.543 (90)	4.724 (120)	1.260 (32)		4.252 (108)	M8 x 1.25	0.630 (16)	2.284 (58)	1.969 (50)	0.158 (4)	0.394 (10)	0.315 (8)	0.197 (5)
SG10SA-PE15□A																	
SG25SA-PE15□A	6.024 (153)	11.634 (295.5)	0.315 (8)	3.819 (97)	4.724 (120)	6.012 (155)	1.575 (40)		5.512 (140)	M10 x 1.5	0.787 (20)	3.228 (82)	2.756 (70)	0.236 (6)	0.472 (12)		
SG50SA-PE15□A																	

Tolerances for standard (SG) gearmotors

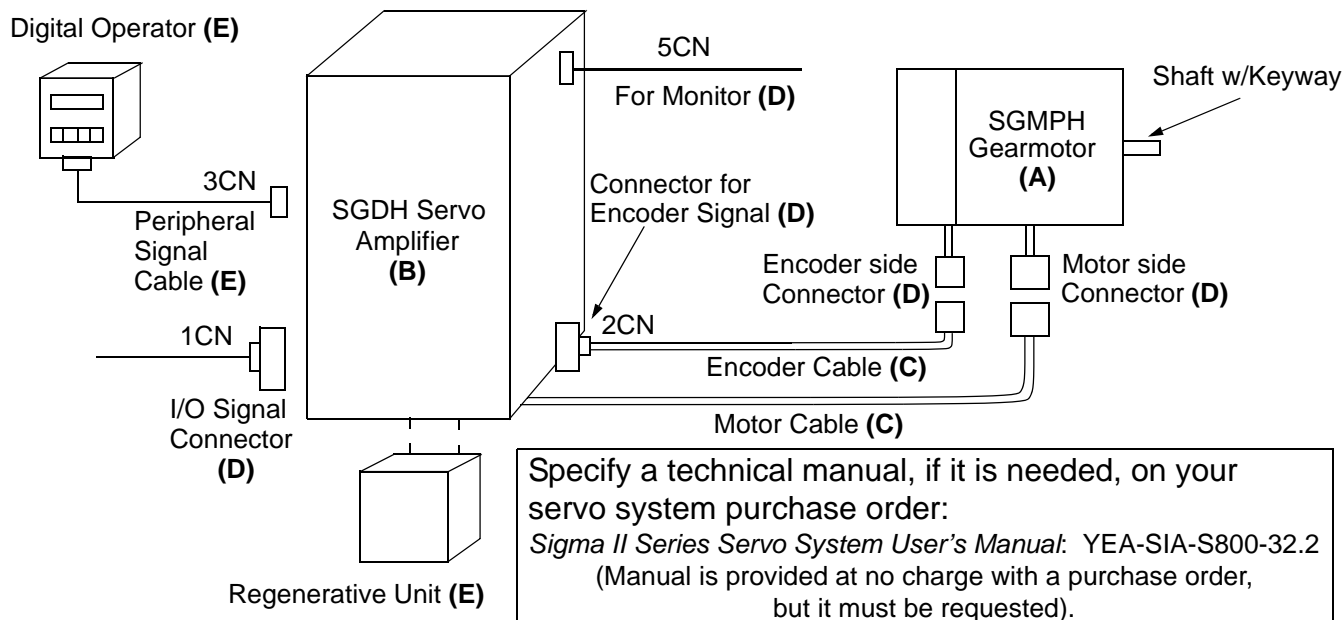
Dimension	ΦS		ΦLB		W	
Unit	Diameter	Tolerance	Diameter	Tolerance	Width	Tolerance
in	0.472, 0.630	+0.00047 +0.00004	1.378	+0.00000 -0.00063	0.158, 0.197, 0.236	+0.00000 -0.00118
	0.866	+0.00059 +0.00008	2.047, 2.677	+0.00000 -0.00075	0.39370	+0.00000 -0.00142
	1.25984, 1.57480	+0.00071 +0.00008	3.5433, 4.724	+0.00000 -0.00087	0.47244	+0.00000 -0.00169
mm	12, 26	+0.012 +0.001	35	+0.000 -0.016	4, 5, 6	+0.000 -0.030
	22	+0.015 +0.002	52, 68	+0.000 -0.019	10	+0.000 -0.036
	32, 40	+0.018 +0.002	90, 120	+0.000 -0.022	12	+0.000 -0.043

Selecting Your SGMPH Gearmotor System

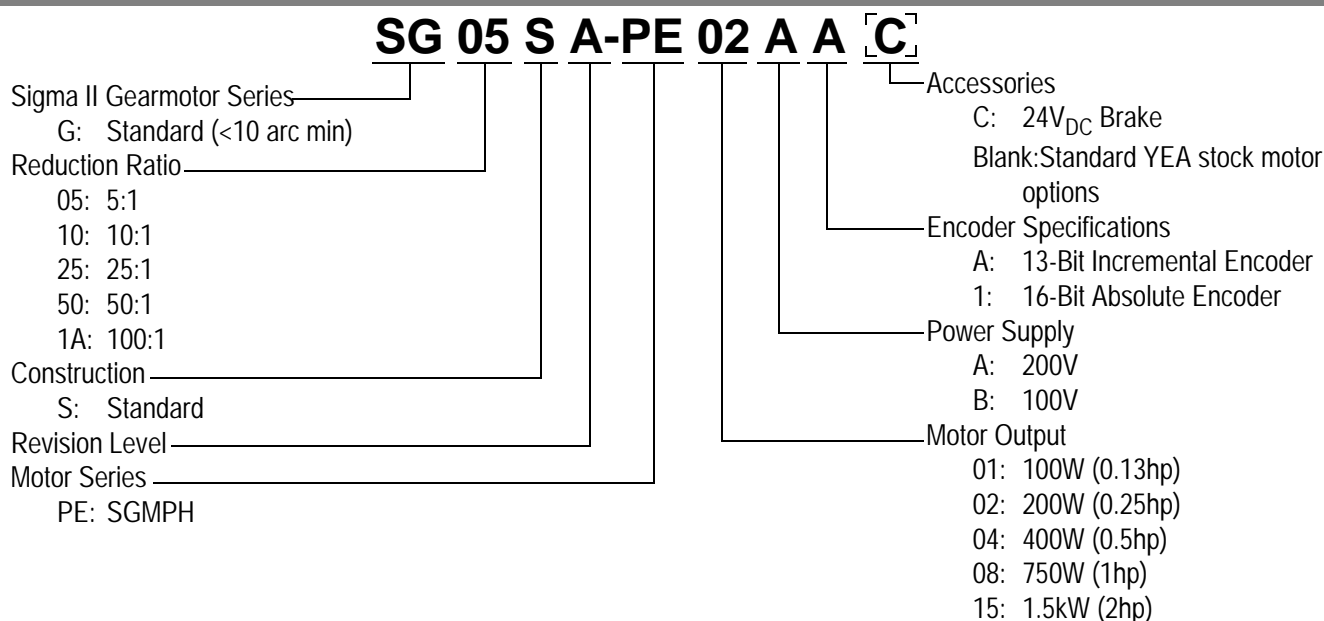
First, select the Sigma II servomotor suited for your application using SigmaSize: the Yaskawa servomotor sizing software, available at no charge. (Request SigmaSize software via e-mail, at: literature@yaskawa.com).

Use the diagram below to locate and identify the components of your system. Each item is letter-coded and cross-referenced in the option tables on the following pages.

System Configuration



Model Number Designation



Gearmotor & Amplifier Selection

Use the table below to select the appropriate SGMPH Sigma II gearmotor and amplifier.

(Refer to the motor model # designation on the previous page specifying the available modification to motor construction/features.)

Gearmotor (A)					Gearhead only		Amplifier MODEL # (B)* SGDH-	Gear Motor Item Class	Amplifier Item Class
MODEL #	Rated Torque (in • lb)	Peak Torque (in • lb)	Rated Speed (rpm)	Maximum Speed (rpm)	Inertia (in • lb • s ²)	Gear Ratio			
SG05SA-PE01AA	13.67	40.93	600	1000	0.000052	5:1	01A□	Normal leadtime 3 - 4 weeks for assembly	Stock
SG10SA-PE01AA	27.34	81.84	300	500		10:1			
SG25SA-PE01AA	66.95	200.39	120	200	0.00025	25:1			
SG50SA-PE01AA	133.89	283.00	60	100		50:1			
SG1ASA-PE01AA	267.78	637.00	30	50	0.0016	100:1			
SG05SA-PE02AA	27.34	81.84	600	1000	0.00025	5:1	02A□		
SG10SA-PE02AA	54.68	163.69	300	500		10:1			
SG25SA-PE02AA	133.89	283.00	120	200		25:1			
SG50SA-PE02AA	267.78	708.00	60	100	0.0016	50:1			
SG1ASA-PE02AA	535.56	1593.00	26	48	0.0049	100:1			
SG05SA-PE04AA	54.81	164.42	600	1000	0.00025	5:1	04A□		
SG10SA-PE04AA	109.61	283.00	300	500		10:1			
SG25SA-PE04AA	268.38	708.00	120	200	0.0016	25:1			
SG50SA-PE04AA	536.75	1610.25	52	96		50:1			
SG1ASA-PE04AA	1073.50	2832.00	20	36	0.0047	100:1			
SG05SA-PE08AA	102.34	306.04	600	1000	0.0016	5:1	08A□		
SG10SA-PE08AA	204.67	612.07	300	500		10:1			
SG25SA-PE08AA	501.13	1498.63	104	192	0.0049	25:1			
SG50SA-PE08AA	1002.25	2997.25	40	72	0.0047	50:1			
SG05SA-PE15AA	205.16	614.50	520	960	0.0048	5:1	15A□		
SG10SA-PE15AA	410.31	1228.99	260	480		10:1			
SG25SA-PE15AA	1004.63	3009.13	80	144	0.0047	25:1			
SG50SA-PE15AA	2009.25	3540.00	40	72	0.0047	50:1			
SG05SA-PE01BA	13.67	40.93	600	1000	0.000052	5:1	01B□		
SG10SA-PE01BA	27.34	81.84	300	500		10:1			
SG25SA-PE01BA	66.95	200.39	120	200	0.00025	25:1			
SG50SA-PE01BA	133.89	283.00	60	100		50:1			
SG1ASA-PE01BA	267.78	637.00	30	50	0.0016	100:1			
SG05SA-PE02BA	27.34	81.84	600	1000	0.00025	5:1	02B□		
SG10SA-PE02BA	54.68	163.69	300	500		10:1			
SG25SA-PE02BA	133.89	283.00	120	200		25:1			
SG50SA-PE02BA	267.78	708.00	60	100	0.0016	50:1			
SG1ASA-PE02BA	535.56	1593.00	26	48	0.0049	100:1			

Notes: 24V_{DC} Brakes for SGMPH Sigma II gearmotors are standard. Contact a local source for 24V_{DC} power supplies.

Use the tables on the following page to specify mating connectors or pre-wired cables in different lengths.

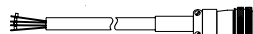
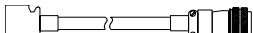
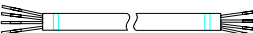
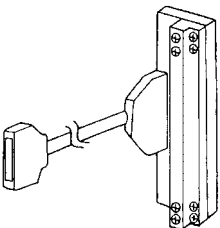
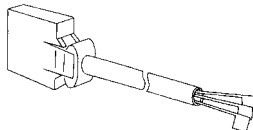
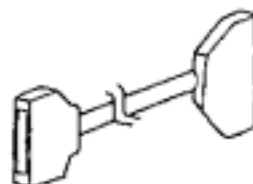
For technical information, request Yaskawa technical bulletin number YEA-TSA-S800-16.16 and Yaskawa manual number TSE-S800-15.

100/200V Single-phase Sigma II Servo Systems

* For more detailed 100/200V SGDh amplifier specifications and dimensions, refer to pages 99 - 112.

Pre-wired Cable Selection

Use the table below to select pre-wired cables for your SGM^{PH} Sigma II gearmotor.

Cable Description (C)		Motor Size (kW)	Part Number*	Comments	Item Class
Power Cable with Intercon- nectron Connectors (without Brake)		0.1, 0.2, 0.4, 0.8	B4ICE-□□(A)	These UL and CE compli- ant cables are available in five lengths. Use the fol- lowing key to specify needed cable length (last two digits of the part num- ber): 03: 3m 05: 5m 10: 10m (standard) 15: 15m 20: 20m	Stock**
		1.5	B5ICE-□□(A)		
Power Cable with Intercon- nectron Connectors (with Brake)	0.1, 0.2, 0.4, 0.8	B4IBCE-□□(A)			
	1.5	B5IBCE-□□(A)			
Encoder Cable with Intercon- nectron Connector (incremental or absolute)		All	A1ICE-□□(A)		
Encoder Cable (for applications up to 20m) Only for Solder Connections			FR-RMCT-SB	These cables are available in any length.	
Encoder Cable (for applications from >20 to <50m) Only for Solder Connections			UL20276-SB	For example, to order one FR-RMCT-SB cable, 16m long, specify: quantity: 16 part no.: FR-RMCT-SB	
Input/Output 1CN Cable & Transition Terminal Block			JUSP-TA50P	35mm DIN rail mountable; the cable length is 0.5 meters.	
Input/Output 1CN Cable with Pigtail Leads			JZSP-CKI01-□(A)	Use the following key to specify required cable length (last digit of part number): 1: 1m (standard) 2: 2m 3: 3m	
Input/Output 1CN Cable Cable with Female D-Sub output Connector***			JZSP-CKI0D-□□	Use the following key to specify required cable length (last two digits of the part number): D50: 0.5m 01: 1m (standard) 02: 2m 03: 3m	

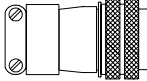
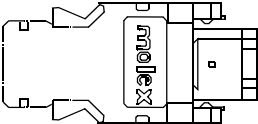
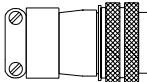

* The "(A)" at the end of the cable part number indicates the revision level. Revision level may be subject to change prior to this catalog reprinting.

** Standard cable lengths are Stock items; non-standard cable lengths are Limited Stock items.

*** 50 Pin Female D-Sub output connector mates to customer supplied third party terminal block. (e.g., Wago #289-449, Weidmuller #919658, Phoenix #2283647, Amphenol/Sine #20-51039, and many others)

Connector Selection

Use the table below to select mating connectors or kits for your SGMPH Sigma II gearmotor.

Connector Description (D)		Motor Size (kW)	Part Number	Comments	Item Class
Interconnectron Connector for Motor Power Cable (with or without Brake)		0.1, 0.2, 0.4, 0.8, 1.5	FIN07S-B2	IP67 Mated Solder Cup	Stock
2CN Amplifier Mating Connector			JZSP-CMP9-1	—	
Interconnectron Connector for Encoder Cable (incremental or absolute encoder)			FIN17C-A2	IP67 Mated Gauge: 24 - 18 AWG Requires Crimp Tool B150 and positioner.	
1CN Mating Connector		All	JZSP-CKI9	—	
Interconnectron Crimp Tool	—		B150	—	Limited Stock
Positioner	—		B055/A	—	